Kramer Electronics, Ltd.

USER MANUAL

Model:

VP-8x4

8x4 VGA / UXGA Matrix Switcher

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1 Introduction

Welcome to Kramer Electronics! Since 1981, Kramer Electronics has been providing a world of unique, creative, and affordable solutions to the vast range of problems that confront the video, audio, presentation, and broadcasting professional on a daily basis. In recent years, we have redesigned and upgraded most of our line, making the best even better! Our 1,000-plus different models now appear in 11 groups[1] that are clearly defined by function.

Congratulations on purchasing the Kramer **VP-8x4** *8x4 VGA / UXGA Matrix Switcher*, which is ideal for:

- Any professional display system requiring a true 8x4 computer graphics matrix operation
- Multimedia and presentation source, and acceptor selection

Each package includes the following items:

- The **VP-8x4** *8x4 VGA / UXGA Matrix Switcher*
- Windows®-based Kramer control software[2]
- Windows®-based Configuration Manager XPort software and Com Port Redirector
- Kramer **RC-IR2** Infrared Remote Control Transmitter (including the required battery and a separate user manual[3])
- Power cord, null-modem adapter and this user manual[3]

2 Getting Started

We recommend that you:

- Unpack the equipment carefully and save the original box and packaging materials for possible future shipment
- Review the contents of this user manual
- Use Kramer high performance high resolution cables[4]

2.1 Quick Start

This quick start chart summarizes the basic setup and operation steps.

1 GROUP 1: Distribution Amplifiers; GROUP 2: Switchers and Matrix Switchers; GROUP 3: Control Systems; GROUP 4: Format/Standards Converters; GROUP 5: Range Extenders and Repeaters; GROUP 6: Specialty AV Products; GROUP 7: Scan Converters and Scalers; GROUP 8: Cables and Connectors; GROUP 9: Room Connectivity; GROUP 10: Accessories and Rack Adapters; GROUP 11: Sierra Products

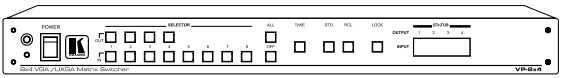
2 Downloadable from our Web site at http://www.kramerelectronics.com

3 Download up-to-date Kramer user manuals from our Web site at http://www.kramerelectronics.com

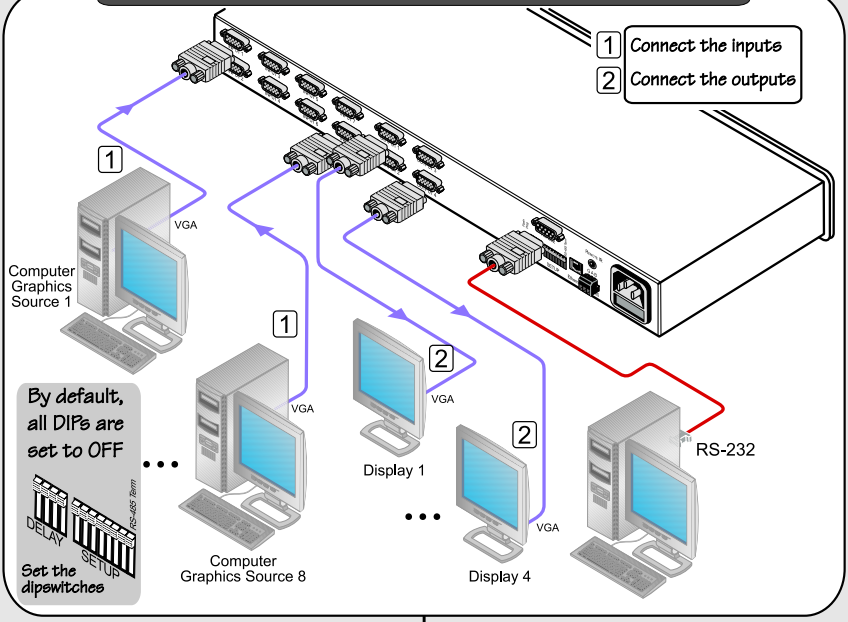
4 The complete list of Kramer cables is on our Web site at http://www.kramerelectronics.com

Step 1: Mount the machine - see section 5

Mount the machine in a rack or stick the 4 rubber feet to the underside

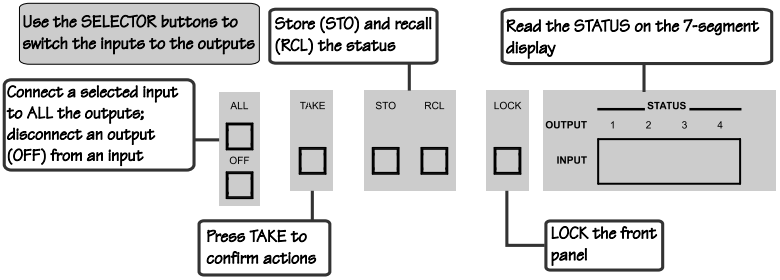


Step 2: Connect the inputs and outputs - see section 6



Step 3: Turn the power ON

Step 4: Operate the machine - see section 7


Use the SELECTOR buttons to switch the inputs to the outputs
Store (STO) and recall (RCL) the status
Read the STATUS on the 7-segment display
Connect a selected input to ALL the outputs; disconnect an output (OFF) from an input
ALL
OFF
TAKE
STO
RCL
LOCK
STATUS
OUTPUT 1 2 3 4
INPUT
Press TAKE to confirm actions
LOCK the front panel

Operate via the front panel buttons, RS-232, RS-485 and/or the Ethernet

3 Overview

The **VP-8x4** is a high-performance, high-resolution computer graphics video switcher. The **VP-8x4** lets you simultaneously route any or all of the eight inputs to any or all of the four outputs.

The **VP-8x4** *8x4 VGA / UXGA Matrix Switcher* features:

- Video bandwidth of 400MHz that ensures transparent performance even in the most critical applications
- 12 preset memory locations for quick access to common configurations
- Delayed switching mode (ranging from 0 to 3.5 sec[1]) for clean transitions (seamless switching) when switching between non-genlocked sources
- DC coupled inputs and outputs
- A TAKE button that allows you to place multiple switches in a queue and then activate them simultaneously with one touch of this button
- A LOCK button to prevent tampering with the front panel
- Automatic detection of connected input signals (respective button illuminates)

Control the **VP-8x4** using the front panel buttons, or remotely via:

- RS-485 or RS-232 serial commands transmitted by a PC, touch screen system, or other serial controller
- The Kramer **RC-IR2** Infrared remote control transmitter or an external remote IR receiver (optional)
- The Ethernet

The **VP-8x4** is a dependable and rugged unit that fits into one vertical space (1U) of a standard 19-inch professional rack[2].

To achieve the best performance:

- Use only good quality connection cables[3] to avoid interference, deterioration in signal quality due to poor matching, and elevated noise levels (often associated with low-quality cables).
- Avoid interference from neighboring electrical appliances that may adversely influence signal quality and position your Kramer **VP-8x4** away from moisture, excessive sunlight and dust

4 Your VP-8x4 8x4 VGA / UXGA Matrix Switcher

Figure 1, Table 1 and Table 2 define the **VP-8x4** *8x4 VGA / UXGA Matrix Switcher*.

1 In increments of 0.5sec

2 The RGBHV signals are connected on 15-pin HD pin connectors to reduce enclosure size

3 Available from Kramer Electronics on our Web site at http://www.kramerelectronics.com

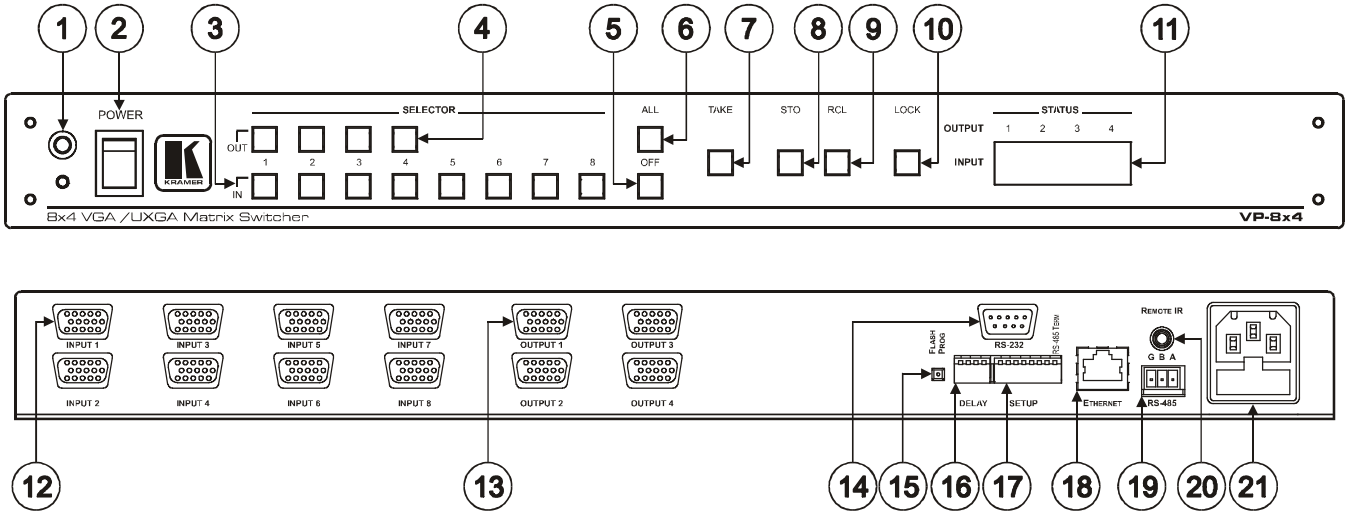


Figure 1: VP-8x4 8x4 VGA / UXGA Matrix Switcher – Front and Rear View

Table 1: Front Panel VP-8x4 8x4 VGA / UXGA Matrix Switcher Features

#	Feature	Function
1	IR Receiver	The red LED is illuminated when receiving signals from the Infrared remote control transmitter
2	*POWER* Switch	Illuminated switch for turning the unit ON or OFF
3	*IN SELECTOR* Buttons	Select the input to switch to the output (from 1 to 8). When a signal is detected, the input button illuminates in green
4	*OUT SELECTOR* Buttons	Select the output to which the input is switched (from 1 to 4)
5	*OFF* Button	Press an *OUT* SELECTOR button and then an *OFF* button to disconnect that output from the inputs Press the *ALL* button and then the *OFF* button to disconnect all the outputs
6	*ALL* Button	Pressing *ALL* followed by an *INPUT* button, connects that input to all outputs[1]
7	*TAKE* Button	Pressing *TAKE* toggles the mode between the Confirm mode[2] and the At Once mode (user confirmation per action is unnecessary). When in TAKE mode, pressing TAKE implements the action
8	*STO* (Store) Button	Pressing *STO* followed by an input/output button stores the current setting[3]
9	*RCL* (*Recall*) Button	Pressing the *RCL* button and the corresponding *IN*/*OUT* button recalls a setup from the non-volatile memory[4]
10	*LOCK* Button	Disengages the front panel switches
11	*STATUS* 7-segment Display	Displays the selected input switched to the output (marked above each input)[5]

1 For example, press ALL and then Input button # 2 to connect input # 2 to all the outputs

2 When in the Confirm mode, the TAKE button illuminates

3 For example, press STO and then the Output button # 3 to store in Setup # 3

4 See section 7.3.2

5 Also displays the number of IN and OUT ports, the firmware version number, and the MACHINE #. Refer to section 7.1

Table 2: Rear Panel VP-8x4 8x4 VGA / UXGA Matrix Switcher Features

#	Feature	Function
12	*INPUT* 15-pin HD (F) Connectors	Connect to the video sources (from 1 to 8)
13	*OUTPUT* 15-pin HD (F) Connectors	Connect to the output acceptor (from 1 to 4)
14	*RS-232* 9-pin D-sub (F) Port	Connects to the PC or the Remote Controller
15	*FLASH PROG* Button	Push in for "Program" to upgrade to the latest Kramer firmware (see section 8), or release for Normal (the factory default)[1]
16	*DELAY* Dipswitches	Dipswitches for setup of the unit (*DELAY* dips 1, 2, 3 are for setting the delay time)[2]
17	*SETUP,* and *RS-485 TERM* Dipswitches	Dipswitches for setup of the unit (*SETUP* dips 1, 2, 3, 4 are for setting machine #; 8 is for RS-485 Termination)[3]
18	*ETHERNET* RJ-45 Connector	Connects to the PC or other Serial Controller through computer networking
19	*RS-485* Terminal Block Port	Pin G is for Ground connection; Pins B (-) and A (+) are for RS-485
20	*REMOTE IR* 3.5mm Mini Jack	Connect to an external IR receiver unit for controlling the machine via an IR remote controller (instead of using the front panel IR receiver)[4]
21	Power Connector with Fuse	AC connector enabling power supply to the unit

Figure 2 illustrates the underside of the **VP-8x4** unit, and Table 3 defines the underside features.

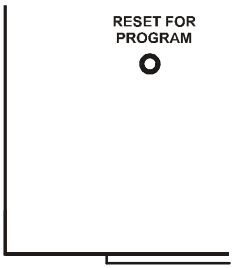


Figure 2: VP-8x4 8x4 VGA / UXGA Matrix Switcher Underside View

Table 3: VP-8x4 8x4 VGA / UXGA Matrix Switcher Underside Panel Feature

Feature	Function
RESET FOR PROGRAM Button	Press to reset unit prior to firmware upgrade (see section 8)

1 The "RESET FOR PROGRAM" button is located on the underside of the unit

2 See section 6.5.1

3 See section 6.5.2

4 Optional. Can be used instead of the front panel (built-in) IR receiver to remotely control the machine (only if the internal IR connection cable has been installed)

4.1 Using the IR Transmitter

You can use the **RC-IR2** IR transmitter to control the machine via the built-in IR receiver on the front panel or, instead, via an optional external IR receiver[1]. The external IR receiver can be located 15 meters away from the machine. This distance can be extended to up to 60 meters when used with three extension cables[2].

Before using the external IR receiver, be sure to arrange for your Kramer dealer to insert the internal IR connection cable[3] with the 3.5mm connector that fits into the REMOTE IR opening on the rear panel.

Connect the external IR receiver to the REMOTE IR 3.5mm connector.

1 Model: C-A35M/IRR-50

2 Model: C-A35M/A35F-50

3 P/N: 505-70434010-S

5 Installing the VP-8x4 in a Rack

This section describes how to install the **VP-8x4** in a rack.

Before Installing on a Rack

Before installing on a rack, be sure that the environment is within the recommended range:	
Operating temperature range	+5º to +45º C (41º to 113º F)
Operating humidity range	10 to 90% RHL, non-condensing
Storage temperature range	-20º to +70º C (-4º to 158º F)
Storage humidity range	5 to 95% RHL, non-condensing

CAUTION!!

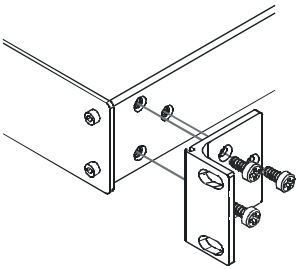
When installing on a 19" rack, avoid hazards by taking care that:

1. It is located within the recommended environmental conditions, as the operating ambient temperature of a closed or multi unit rack assembly may exceed the room ambient temperature.
2. Once rack mounted, enough air will still flow around the machine.
3. The machine is placed straight in the correct horizontal position.
4. You do not overload the circuit(s). When connecting the machine to the supply circuit, overloading the circuits might have a detrimental effect on overcurrent protection and supply wiring. Refer to the appropriate nameplate ratings for information. For example, for fuse replacement, see the value printed on the product label.
5. The machine is earthed (grounded) in a reliable way and is connected only to an electricity socket with grounding. Pay particular attention to situations where electricity is supplied indirectly (when the power cord is not plugged directly into the socket in the wall), for example, when using an extension cable or a power strip, and that you use only the power cord that is supplied with the machine.

How to Rack Mount

To rack-mount a machine:

1. Attach both ear brackets to the machine. To do so, remove the screws from each side of the machine (3 on each side), and replace those screws through the ear brackets.



2. Place the ears of the machine against the rack rails, and insert the proper screws (not provided) through each of the four holes in the rack ears.

Note that:

- **In some models, the front panel may feature built-in rack ears**
- Detachable rack ears can be removed for desktop use
- Always mount the machine in the rack before you attach any cables or connect the machine to the power
- If you are using a Kramer rack adapter kit (for a machine that is not 19"), see the Rack Adapters user manual for installation instructions (you can download it at: http://www.kramerelectronics.com)

6 Connecting the VP-8x4 8x4 VGA / UXGA Matrix Switcher

This section describes how to:

- Connect the **VP-8x4** rear panel (see section 6.1)
- Connect the **VP-8x4** to a controlling device via RS-232 (see section 6.2), RS-485 (see section 6.3) and/or the Ethernet (see section 6.4)
- Set the dipswitches (see section 6.5)
- Connect several **VP-8x4** machines (see section 6.6)

6.1 Connecting the VP-8x4 Rear Panel

To connect the **VP-8x4** as shown in the example in Figure 3, do the following[1]:

1. Connect up to eight VGA/UXGA computer graphics sources to the INPUT connectors[2].
2. Connect[3] up to four output connectors to the VGA/UXGA video acceptors (for example displays or connectors).
3. Set the dipswitches (see section 6.4).
4. If required, connect a PC and/or controller to the RS-232 port (see section 6.2) and/or RS-485 port (see section 6.3).
5. Connect the power cord[4] (not shown in Figure 3).

1 Switch OFF the power on each device before connecting it to your VP-8x4. After connecting your VP-8x4, switch on its power and then switch on the power on each device. DO NOT push in the rear panel Flash Program "Program" button and DO NOT push in the underside Flash Program "Reset" button. These are only used for upgrading to the latest Kramer firmware (see section 8)

2 Not all inputs need to be connected

3 When less than four outputs are required, connect only those outputs of the VP-8x4 that are required, and leave the other outputs unconnected

4 We recommend that you use only the power cord that is supplied with this machine

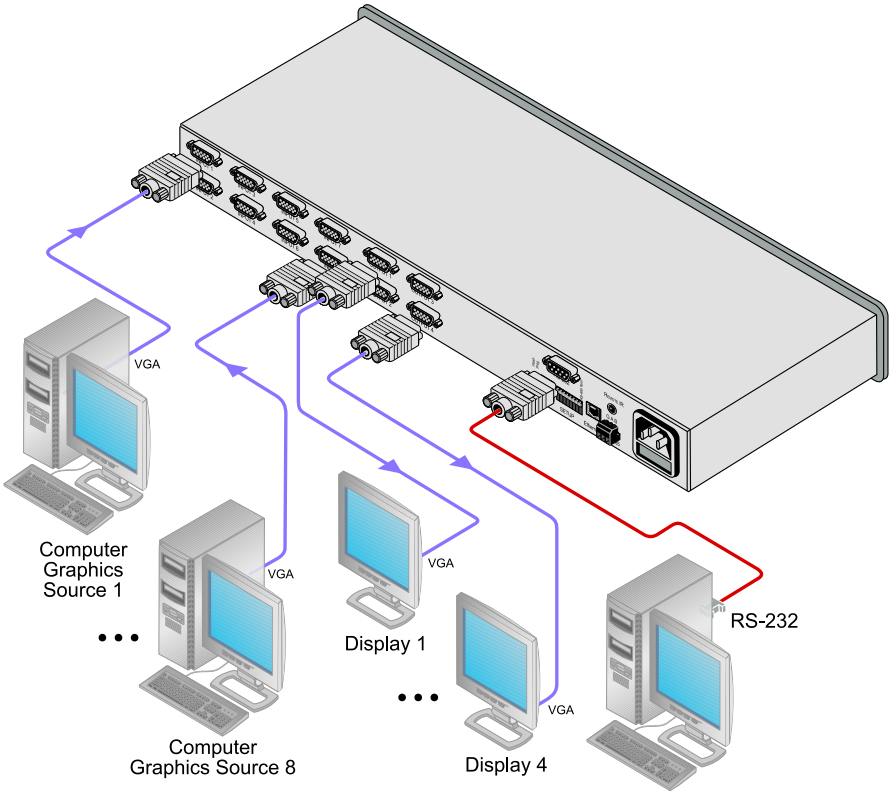


Figure 3: Connecting the VP-8x4 8x4 VGA / UXGA Matrix Switcher

6.2 Controlling via RS-232 (for example, using a PC)

To connect a PC to the **VP-8x4** unit, using the null-modem adapter provided *with* the machine (recommended):

- Connect the null-modem adapter to the RS-232 9-pin D-sub port on the rear panel of the Master **VP-8x4**. Connect the null-modem adapter to the RS-232 9-pin D-sub port on your PC with a 9-wire flat cable

To connect a PC to the **VP-8x4** unit, *without* using a null-modem adapter:

- Connect the RS-232 9-pin D-sub port on your PC to the RS-232 9-pin D-sub rear panel port on the Master **VP-8x4** unit, as Figure 4 illustrates

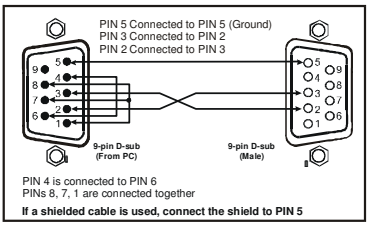

PIN 5 Connected to PIN 5 (Ground)
PIN 3 Connected to PIN 2
PIN 2 Connected to PIN 3
9-pin D-sub (From PC)
9-pin D-sub (Male)
PIN 4 is connected to PIN 6
PINs 8, 7, 1 are connected together
If a shielded cable is used, connect the shield to PIN 5

Figure 4: Connecting a PC without using a Null-modem Adapter

6.3 Controlling via RS-485

You can control a **VP-8x4** unit via an RS-485 controller, for example, a PC (equipped with an RS-485 interface) or a Master Programmable Remote Control system such as the Kramer **RC-3000**.

To connect an **RC-3000** to a **VP-8x4** unit (see Figure 5):

1. Connect the RS-485 terminal block port on the **RC-3000** to the RS-485 port on the **VP-8x4** unit, as follows:
   - Connect the "A" (+) PIN on the RS-485 rear panel port of the **RC-3000** to the "A" (+) PIN on the RS-485 rear panel port of the **VP-8x4** unit
   - Connect the "B" (-) PIN on the RS-485 rear panel port of the RC-3000 to the "B" (-) PIN on the RS-485 rear panel port of the **VP-8x4** unit
   - If shielded twisted pair cable is used, the shield may be connected to the "G" (Ground) PIN on one of the units (for example, on the RC-3000)
2. Set the **VP-8x4** unit as Machine # 1, according to Table 6 (that is, DIP 1, DIP 2, DIP 3, and DIP 4 OFF), and set the other dipswitches on the **VP-8x4** unit, as follows:
   - Set DIP 5, DIP 6, and DIP 7 OFF
   - Set DIP 8 ON (for RS-485 Line Termination with 120Ω)

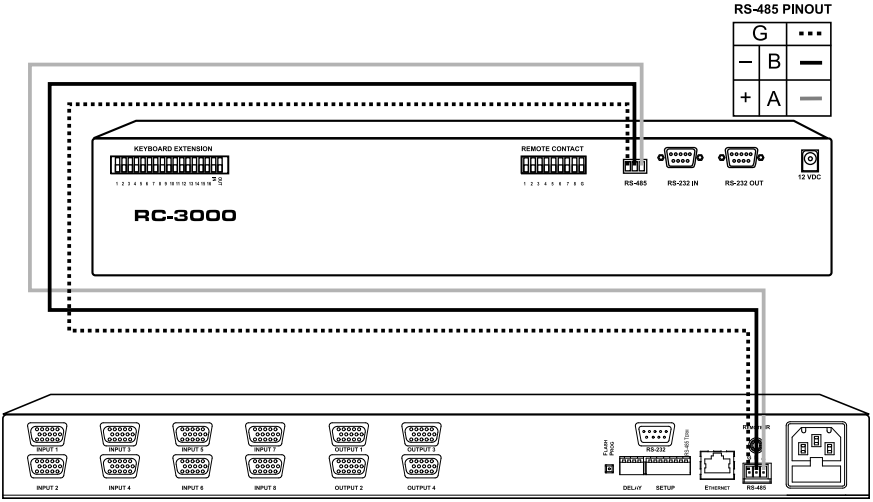


Figure 5: Controlling via RS-485 (for example, using an RC-3000)

6.4 Control Configuration via the Ethernet Port

To connect and configure the Ethernet port of the **VP-8x4**, refer to the ETHERNET Configuration (Lantronix) GUIDE on our Web site: http://www.kramerelectronics.com.

6.5 Setting the DIP-switches

By default, all dipswitches are set to OFF. Figure 6 illustrates the **VP-8x4** DIP-switches:

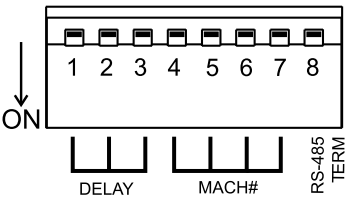


Figure 6: VP-8x4 DIP-switches

Table 4: DIP-switch Settings

DIPS	Function	Description
1, 2, 3	DELAY	Determines switching delay time
4, 5, 6, 7	Machine #	Determines the number of the machine in the sequence
8	RS-485 TERM	ON for RS-485 line termination with 120Ω; OFF for no RS-485 line termination

6.5.1 Setting the Delay

You can achieve clean transitions when switching between non-genlocked sources by setting the delay time—ranging from 0 sec to 3.5 sec[1]—via the DELAY DIP-switches, as Table 5 defines. The **VP-8x4** unit is shipped (its factory default state) with no delay, that is, the DELAY DIP-switches are set up for a 0 sec delay. The delay time is the period where the output will be forced to black when switching between inputs.

Table 5: DELAY DIP-switch Settings

sec	DIP 1	DIP 2	DIP 3
0	OFF	OFF	OFF
0.5	OFF	OFF	ON
1.0	OFF	ON	OFF
1.5	OFF	ON	ON
2.0	ON	OFF	OFF
2.5	ON	OFF	ON
3.0	ON	ON	OFF
3.5	ON	ON	ON

6.5.2 Setting the Machine # DIP-switches

The Machine # determines the address of a **VP-8x4** unit, specifying which **VP-8x4** unit is being controlled when several **VP-8x4** units are connected to a PC or serial controller. Set the Machine # on a **VP-8x4** unit via MACH# DIPs 4, 5, 6 and 7, according to Table 6.

When using a standalone **VP-8x4** unit, set the Machine # to 1. When connecting more than one **VP-8x4** unit, set the first machine (the Master) that is closest to the PC, as Machine # 1 (DIP-switches are set to OFF).

Table 6: Machine # DIP-switch Settings

Mach. #	DIP 4	DIP 5	DIP 6	DIP 7
1	OFF	OFF	OFF	OFF
2	OFF	OFF	OFF	ON
3	OFF	OFF	ON	OFF
4	OFF	OFF	ON	ON
5	OFF	ON	OFF	OFF
6	OFF	ON	OFF	ON
7	OFF	ON	ON	OFF
8	OFF	ON	ON	ON

Mach. #	DIP 4	DIP 5	DIP 6	DIP 7
9	ON	OFF	OFF	OFF
10	ON	OFF	OFF	ON
11	ON	OFF	ON	OFF
12	ON	OFF	ON	ON
13	ON	ON	OFF	OFF
14	ON	ON	OFF	ON
15	ON	ON	ON	OFF
16	ON	ON	ON	ON

1 In increments of 0.5sec

6.6 Cascading Machines

You can cascade up to 16 **VP-8x4** units with control from a PC or serial controller (see Figure 7).

To cascade up to 16 individual **VP-8x4** units via RS-485, do the following:

1. Connect the VGA/UXGA sources and acceptors, as section 6.1 describes.
2. Connect the RS-232 port[1] on the first **VP-8x4** unit to the PC using the null-modem adapter provided with the machine (recommended), as section 6.2 describes.
3. Connect the RS-485 terminal block port on the first unit to the RS-485 port on the second **VP-8x4** unit and so on, connecting all the RS-485 ports.
4. Set the dipswitches, as section 6.4 describes:
   - Set the first **VP-8x4** unit as Machine # 1 and the following 15 **VP-8x4** units as Machine # 2 to Machine # 16, according to Table 6
   - Set DIP 8 ON on the first and last **VP-8x4** units (terminating the RS-485 line at 120Ω). Set DIP 8 OFF on the other **VP-8x4** units
   - Set DIP 5, DIP 6 and DIP 7 OFF on all **VP-8x4** units

1 Alternatively, the RS-485 port could be used for PC control (instead of RS-232)

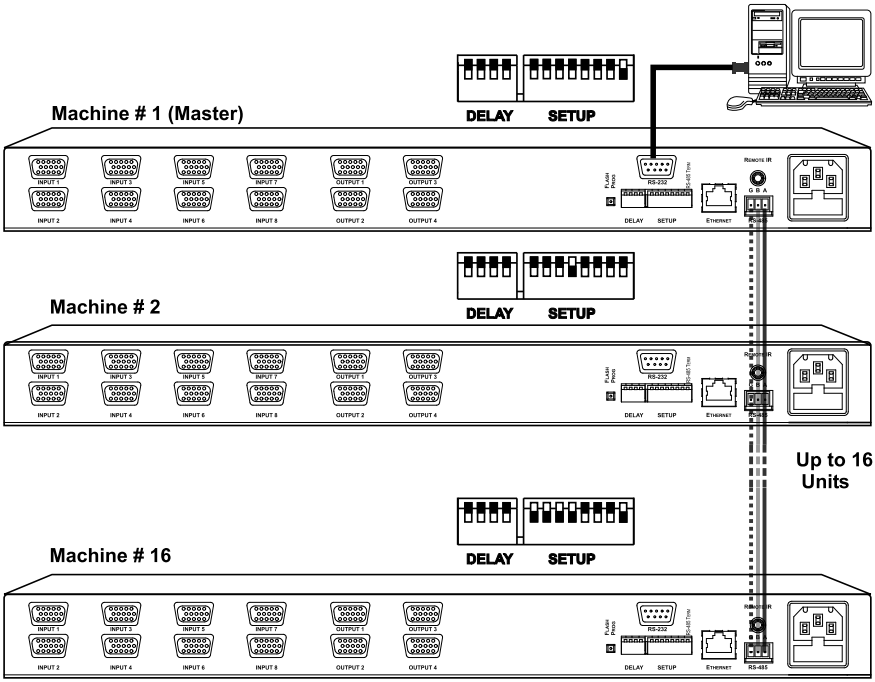


Figure 7: Control Configuration via RS-232 and RS-485

7 Operating the VP-4x8 8x4 VGA / UXGA Matrix Switcher

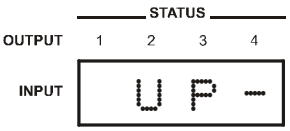
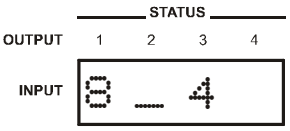
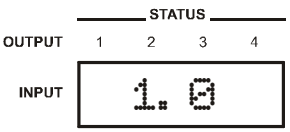
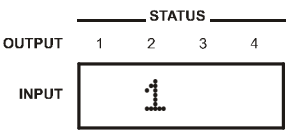
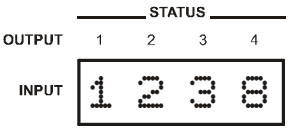
You can operate your **VP-8x4** via:

- The front panel buttons
- RS-232/RS-485 serial commands transmitted by a touch screen system, PC, or other serial controller
- The Kramer **RC-IR2** Infrared Remote Control Transmitter
- The Ethernet

7.1 Displaying Unit Characteristics

The STATUS 7-segment display shows several sets of information in sequence, as defined in Table 7:

Table 7: STATUS 7-segment Display

The STATUS Display Sequence	Indicates the:	When:
	Device type: VP-8x4	Immediately (and automatically) after switching on the power
		
	Firmware version	Immediately (and automatically) after switching on the power
	Machine number	
	Normal display: Inputs switched to the outputs	During normal operation, appears a few seconds after the first display[1]

1 The “First Display” appears initially, followed a few seconds later by the “Second Display”, then the “Third Display”

7.2 Confirming Settings

You can choose to work in the At Once or the Confirm mode.

In the At Once mode (the TAKE button is not illuminated):

- Pressing an OUT-IN combination implements the switch immediately
- You save time as execution is immediate and actions require no user confirmation
- No protection is offered against changing an action in error

In the Confirm mode (TAKE button is illuminated):

- You can key-in several actions and then confirm them by pressing the TAKE button, to simultaneously activate the multiple switches
- Every action requires user confirmation, protecting against erroneous switching
- Execution is delayed[1] until the user confirms the action

7.2.1 Toggling between the At Once and Confirm Modes

To toggle between the At Once and Confirm modes, do the following:

1. Press the dim TAKE button to toggle from the At Once mode (in which the TAKE button is dim) to the Confirm mode (in which the TAKE button illuminates).
   Actions now require user confirmation and the TAKE button illuminates.
2. Press the illuminated TAKE button to toggle from the Confirm mode back to the At Once mode.
   Actions no longer require user confirmation and the TAKE button no longer illuminates.

7.2.2 Confirming a Switching Action

To confirm a switching action (in the Confirm mode), do the following:

1. Press an OUT-IN combination.
   The corresponding 7-segment Display blinks. The TAKE button also blinks.
2. Press the blinking TAKE button to confirm the action.
   The corresponding 7-segment Display no longer blinks. The TAKE button illuminates.

1 Failure to press the TAKE button within one minute (the Timeout) aborts the action

To confirm several actions (in the Confirm mode), do the following:

1. Press each OUT-IN combination in sequence.
   The corresponding 7-segment Display blinks. The TAKE button also blinks.
2. Press the blinking TAKE button to confirm all the actions.
   The corresponding 7-segment Display no longer blinks. The TAKE button illuminates.

7.3 Storing/Recalling Input/Output Configurations

You can store and recall up to 12 setups[1] using the eight input buttons and the four output buttons, as *Figure 8* illustrates:

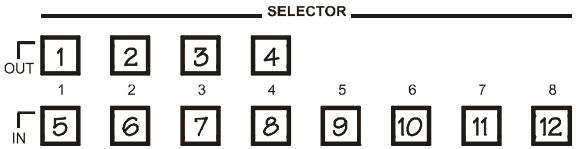


Figure 8: Storing and Recalling using the Input/Output Buttons

7.3.1 Storing an Input/Output Configuration

To store the current status in memory, do the following:

1. Press the STO button.
   The STO button blinks.
2. Press one of the 12 INPUT/OUTPUT buttons (this will be the setup # in which the current status is stored). If in the Confirm mode, press the blinking TAKE button to confirm the action.
   The memory stores the data at that reference.

7.3.2 Recalling an Input/Output Configuration

To recall an input/output configuration, do the following:

1. Press the RCL button.
   The RCL button blinks.
2. Press the appropriate INPUT/OUTPUT button (the button # corresponding to the setup #). If in the Confirm mode, that setup configuration will blink in the 7-segment Display, together with the RCL button and the TAKE button, and will only be implemented after pressing the TAKE button.
   The memory recalls the stored data from that reference.

1 OUT 1 is used for setup # 1 and IN 1 is used for setup # 5

Tip: If you cannot remember which of the 12 input/output configurations is the one that you want, set the **VP-8x4** to the Confirm mode and manually scan all the input/output configurations until you locate it.

7.3.3 Deleting an Input/Output Configuration

To delete an input/output configuration, do the following:

1. Press the STO and RCL buttons simultaneously.
   Both the STO and RCL buttons blink.
2. Press the appropriate INPUT/OUTPUT button.
   This erases that specific input/output configuration from the memory, leaving it empty and available[1].

7.4 Locking the Front Panel

To prevent changing the settings accidentally or tampering with the unit via the front panel buttons, lock[2] your **VP-8x4**. Unlocking releases the protection mechanism.

To lock the **VP-8x4**:

- Press the LOCK button for more than two seconds, until the LOCK button is illuminated
  The front panel is locked. Pressing a button will have no effect other than causing the LOCK button to blink[3]

To unlock the **VP-8x4**:

- Press the illuminated LOCK button for more than two seconds, until the LOCK button is no longer illuminated
  The front panel unlocks

1 Storing a new configuration over a previous configuration (without deleting it first) replaces the previous configuration

2 Nevertheless, even though the front panel is locked you can still operate via RS-232 or RS-485, as well as via the Kramer RC-IR2 Infrared Remote Control Transmitter

3 Warning that you need to unlock to regain control via the front panel

8 Flash Memory Upgrade

The **VP-8x4** firmware is located in FLASH memory, which lets you upgrade to the latest Kramer firmware version in minutes!

Note: The firmware update should be carried out by skilled technical personnel. Failure to update correctly can cause machine malfunction.

The process involves:

- Downloading from the Internet (see section 8.1)
- Connecting the PC to the RS-232 port (see section 8.2)
- Upgrading Firmware (see section 8.3)

8.1 Downloading from the Internet

You can download the up-to-date file[1] from the Internet. To do so:

1. Go to our Web site at www.kramerelectronics.com and download the file: "*FLIP_VP8x4.zip*" from the Technical Support section.
2. Extract the file: "*FLIP_VP8x4.zip*" to a folder (for example, C:\Program Files\Kramer Flash).
3. Create a shortcut on your desktop to the file: "*FLIP.EXE*".

8.2 Connecting the PC to the RS-232 Port

Before installing the latest Kramer firmware version on a **VP-8x4** unit, do the following:

1. Connect a serial cable from the **VP-8x4** RS-232 9-pin D-sub rear panel port to a PC as explained in section 6.2.
2. On the rear panel, push in the FLASH PROG button (to program), using a screwdriver.
3. Connect the power on the **VP-8x4** unit and switch it ON.
4. On the underside panel, push in the RESET FOR PROGRAM button (see Figure 2), using a screwdriver.

1 The files indicated in this section are given as an example only. File names are liable to change from time to time

8.3 Upgrading Firmware

Follow these steps to upgrade the firmware:

1. Double click the desktop icon: "*Shortcut to FLIP.EXE*".
   The Splash screen appears as follows:

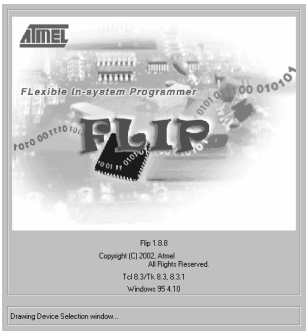


Figure 9: Splash Screen

2. After a few seconds, the Splash screen is replaced by the "*Atmel – Flip*" window:

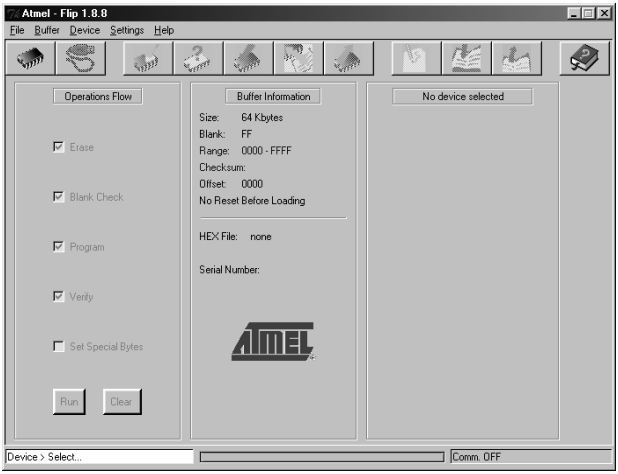


Figure 10: Atmel – Flip Window

3. Press the keyboard shortcut key *F2* (or select the "*Select*" command from the *Device* menu, or press the integrated circuit icon in the upper right corner of the window).
   The "*Device Selection*" window appears:

Figure 11: Device Selection Window

4. Click the button next to the name of the device and select from the list: AT89C51RD2:

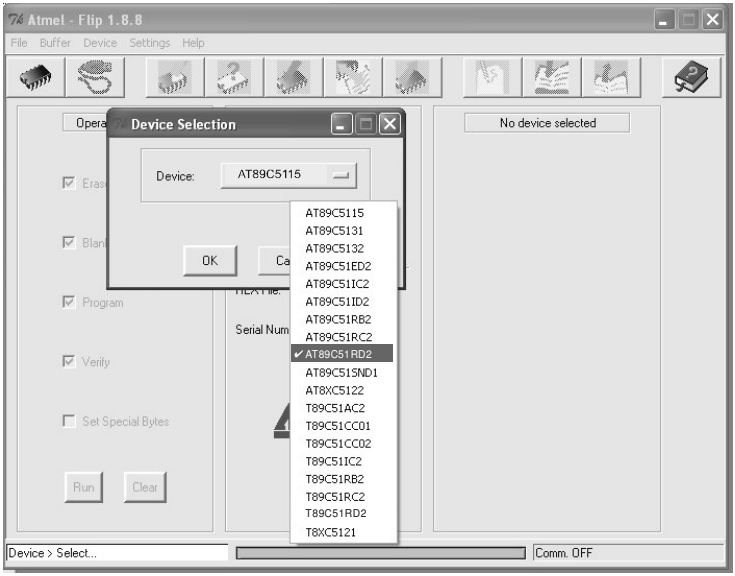


Figure 12: Selecting the Device from the Selection Window

5. Click OK and select "*Load Hex*" from the *File* menu.

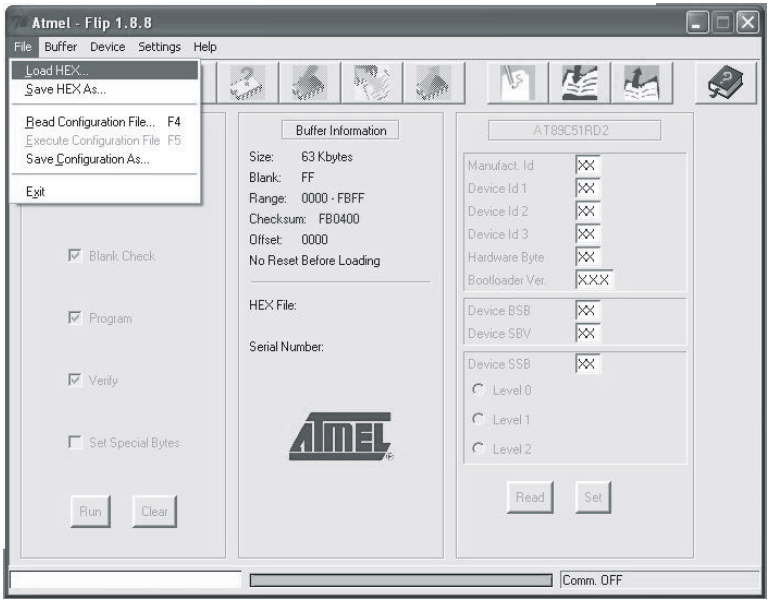


Figure 13: Loading the Hex

6. The Open File window opens. Select the correct HEX file that contains the updated version of the firmware for **VP-8x4** (for example ***8x4M_V1p2.hex***) and click Open.

7. Press the keyboard shortcut key *F3* (or select the "*Communication / RS232*" command from the *Settings* menu, or press the keys: *Alt SCR*). The "*RS232*" window appears. Change the COM port according to the configuration of your computer and select the 9600 baud rate:

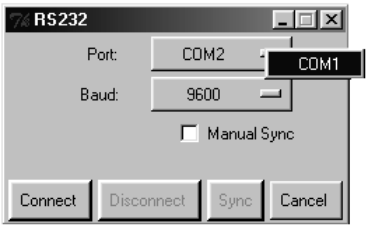


Figure 14: RS-232 Window

8. Click Connect.
   In the "*Atmel – Flip*" window, in the *Operations Flow* column, the *Run* button is active, and the name of the chip appears as the name of the third column: *AT89C51RD2*.

Verify that in the *Buffer Information* column, the "*HEX File: VP8x4.hex*" appears.

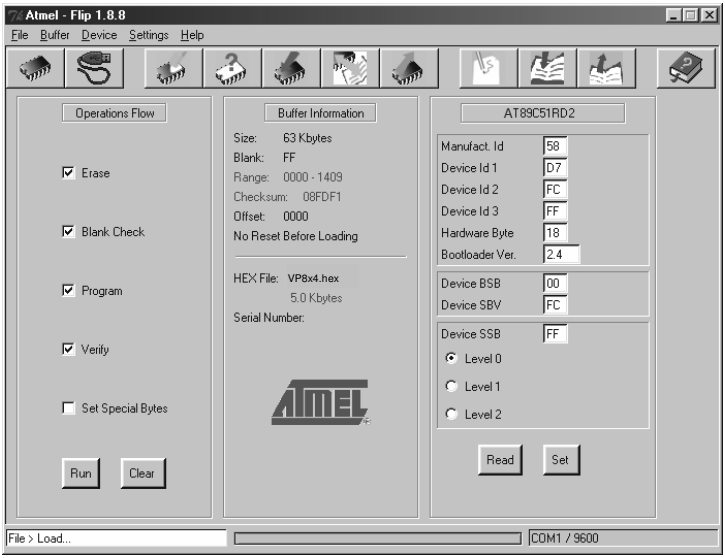


Figure 15: Atmel – Flip Window (Connected)

9. Click *Run*.
   After each stage of the operation is completed, the check-box for that stage becomes colored green[1].
   When the operation is completed, all 4 check-boxes will be colored green and the status bar message: *Memory Verify Pass* appears[2]:

1 See also the blue progress indicator on the status bar

2 If an error message: "Not Finished" shows, click Run again

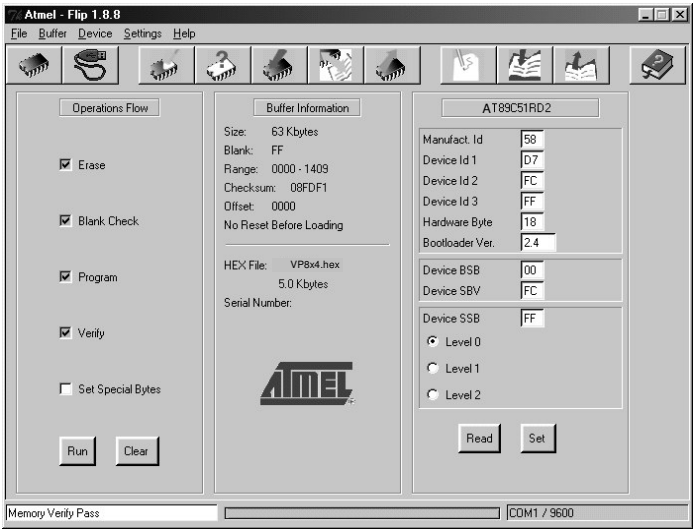


Figure 16: Atmel – Flip Window (Operation Completed)

10. Close the "*Atmel – Flip*" window.
11. Disconnect the power on the **VP-8x4**.
12. Disconnect the *RS-232* rear panel port on the **VP-8x4** unit from the Null-modem adapter.
13. Release FLASH PROG button on rear panel (see Figure 1).
14. Connect the power to the **VP-8x4**.
    Upon initialization, the new **VP-8x4** software version shows in the INPUT STATUS 7-segment Display (see Table 7).

9 Technical Specifications

The **VP-8x4** technical specifications are shown in Table 8:

Table 8: VP-8x4 Technical Specifications[1]

INPUTS:	8 computer graphics video on 15-pin HD connectors (VGA through UXGA)
OUTPUTS:	4 computer graphics video on 15-pin HD connectors (VGA through UXGA)
MAX. OUTPUT LEVEL:	1.5Vpp
BANDWIDTH (-3dB):	400MHz
DIFF. GAIN:	0.04%
DIFF. PHASE:	0.04Deg
K-FACTOR:	<0.05%
S/N RATIO:	75dB
CROSSTALK (all hostile):	–53dB
CONTROLS:	18 front panel buttons, RS-232, RS-485, Ethernet
COUPLING:	DC
POWER SOURCE:	100–240V AC, 50/60Hz, 11VA
DIMENSIONS	19" x 7" x 1U W, D, H, rack mountable
WEIGHT:	2.7kg (6lbs) approx
ACCESSORIES:	Power cord, null-modem adapter, Windows®-based Kramer control software, infrared remote control transmitter
OPTIONS:	External remote IR receiver cable

10 Table of Hex Codes for Serial Communication

Table 9 lists the Hex values for a single machine (*MACHINE #* 1):

Table 9: VP-8x4 Hex Codes for Switching via RS-232/RS-485

	Switching Video Channels															
	OUT 1				OUT 2				OUT 3				OUT 4			
IN 1	01	81	81	81	01	81	82	81	01	81	83	81	01	81	84	81
IN 2	01	82	81	81	01	82	82	81	01	82	83	81	01	82	84	81
IN 3	01	83	81	81	01	83	82	81	01	83	83	81	01	83	84	81
IN 4	01	84	81	81	01	84	82	81	01	84	83	81	01	84	84	81
IN 5	01	85	81	81	01	85	82	81	01	85	83	81	01	85	84	81
IN 6	01	86	81	81	01	86	82	81	01	86	83	81	01	86	84	81
IN 7	01	87	81	81	01	87	82	81	01	87	83	81	01	87	84	81
IN 8	01	88	81	81	01	88	82	81	01	88	83	81	01	88	84	81

1 Specifications are subject to change without notice

11 Kramer Protocol 2000[1]

The **VP-8x4** is compatible with Kramer's Protocol 2000[2], version 0.50. This RS-232/RS-485 communication protocol uses four bytes of information as defined below. For RS-232, a null-modem connection between the machine and controller is used. The default data rate is 9600 baud, with no parity, 8 data bits, and 1 stop bit.

Table 10: Protocol Definitions

MSB							LSB
	DESTI-NATION	**INSTRUCTION**					
0	D	N5	N4	N3	N2	N1	N0
7	6	5	4	3	2	1	0
1st byte							
	INPUT						
1	I6	I5	I4	I3	I2	I1	I0
7	6	5	4	3	2	1	0
2nd byte							
	OUTPUT						
1	O6	O5	O4	O3	O2	O1	O0
7	6	5	4	3	2	1	0
3rd byte							
			MACHINE NUMBER				
1	OVR	X	M4	M3	M2	M1	M0
7	6	5	4	3	2	1	0
4th byte							

1st BYTE: Bit 7 – Defined as 0.
D – "DESTINATION": 0 - for sending information to the switchers (from the PC);
1 - for sending to the PC (from the switcher).
N5…N0 – "INSTRUCTION"
The function that is to be performed by the switcher(s) is defined by the INSTRUCTION (6 bits). Similarly, if a function is performed via the machine's keyboard, then these bits are set with the INSTRUCTION NO., which was performed. The instruction codes are defined according to the table below (INSTRUCTION NO. is the value to be set for N5…N0).

2nd BYTE: Bit 7 – Defined as 1.
I6…I0 – "INPUT".
When switching (ie. instruction codes 1 and 2), the INPUT (7 bits) is set as the input number which is to be switched. Similarly, if switching is done via the machine's front-panel, then these bits are set with the INPUT NUMBER which was switched. For other operations, these bits are defined according to the table.

3rd BYTE: Bit 7 – Defined as 1.
O6…O0 – "OUTPUT".
When switching (ie. instruction codes 1 and 2), the OUTPUT (7 bits) is set as the output number which is to be switched. Similarly, if switching is done via the machine's front-panel, then these bits are set with the OUTPUT NUMBER which was switched. For other operations, these bits are defined according to the table.

1 You can download our user-friendly "Software for Calculating Hex Codes for Protocol 2000" from the technical support section on our Web site at: http://www.kramerelectronics.com

2 The instruction codes in Table 11 are a sub-set of the Protocol 2000. You can find the full protocol on our Web site at http://www.kramerelectronics.com

4th BYTE: Bit 7 – Defined as 1.
Bit 5 – Don't care.
OVR – Machine number override.
M4…M0 – MACHINE NUMBER.

Used to address machines in a system via their machine numbers. When several machines are controlled from a single serial port, they are usually configured together with each machine having an individual machine number. If the OVR bit is set, then all machine numbers will accept (implement) the command, and the addressed machine will reply.

For a single machine controlled via the serial port, always set M4…M0 = 1, and make sure that the machine itself is configured as MACHINE NUMBER = 1.

Table 11: Instruction Codes for Protocol 2000

Note: All values in the table are decimal, unless otherwise stated.

INSTRUCTION		DEFINITION FOR SPECIFIC INSTRUCTION		NOTE
#	DESCRIPTION	INPUT	OUTPUT	
0	RESET VIDEO	0	0	1
1	SWITCH VIDEO	Set equal to video input which is to be switched (0 = disconnect)	Set equal to video output which is to be switched (0 = to all the outputs)	2, 15
3	STORE VIDEO STATUS	Set as SETUP #	0 - to store 1 - to delete	2, 3, 15
4	RECALL VIDEO STATUS	Set as SETUP #	0	2, 3, 15
5	REQUEST STATUS OF A VIDEO OUTPUT	Set as SETUP #	Equal to output number whose status is reqd	4, 3
15	REQUEST WHETHER SETUP IS DEFINED / VALID INPUT IS DETECTED	SETUP # or Input #	0 - for checking if setup is defined 1 - for checking if input is valid	8
16	ERROR / BUSY	For invalid / valid input (i.e. OUTPUT byte = 4 or OUTPUT byte = 5), this byte is set as the input #	0 - error 1 - invalid instruction 2 - out of range 3 - machine busy 4 - invalid input 5 - valid input 6 - RX buffer overflow	9, 25
30	LOCK FRONT PANEL	0 - Panel unlocked 1 - Panel locked	0	2
31	REQUEST WHETHER PANEL IS LOCKED	0	0	16
57	SET AUTO-SAVE	I3 - no save I4 - auto-save	0	12, 2
61	IDENTIFY MACHINE	1 - video machine name 3 – video software version	0 - Request first 4 digits 1 - Request first suffix 2 - Request second suffix 3 - Request third suffix 10 - Request first prefix 11 - Request second prefix 12 - Request third prefix	13
62	DEFINE MACHINE	1 - number of inputs 2 - number of outputs 3 - number of setups	1 - for video	14

NOTES on the above table:

NOTE 1 - When the master switcher is reset, (e.g. when it is turned on), the reset code is sent to the PC. If this code is sent to the switchers, it will reset according to the present power-down settings.

NOTE 2 - These are bi-directional definitions. That is, if the switcher receives the code, it will perform the instruction; and if the instruction is performed (due to a keystroke operation on the front panel), then these codes are sent. For example, if the HEX code

01 85 88 83

was sent from the PC, then the switcher (machine 3) will switch input 5 to output 8. If the user switched input 1 to output 7 via the front panel keypad, then the switcher will send HEX codes:

41 81 87 83

to the PC.

When the PC sends one of the commands in this group to the switcher, then, if the instruction is valid, the switcher replies by sending to the PC the same four bytes that it was sent (except for the first byte, where the DESTINATION bit is set high).

NOTE 3 - SETUP # 0 is the present setting. SETUP # 1 and higher are the settings saved in the switcher's memory, (i.e. those used for Store and Recall).

NOTE 4 - The reply to a "REQUEST" instruction is as follows: the same instruction and INPUT codes as were sent are returned, and the OUTPUT is assigned the value of the requested parameter. The replies to instructions 10 and 11 are as per the definitions in instructions 7 and 8 respectively. For example, if the present status of machine number 5 is breakaway setting, then the reply to the HEX code

0B 80 80 85
would be HEX codes
4B 80 81 85

NOTE 8 - The reply is as in TYPE 3 above, except that here the OUTPUT is assigned with the value 0 if the setup is not defined / no valid input is detected; or 1 if it is defined / valid input is detected.

NOTE 9 - An error code is returned to the PC if an invalid instruction code was sent to the switcher, or if a parameter associated with the instruction is out of range (e.g. trying to save to a setup greater than the highest one, or trying to switch an input or output greater than the highest one defined). This code is also returned to the PC if an RS-232 instruction is sent while the machine is being programmed via the front panel. Reception of this code by the switcher is not valid.

NOTE 12 - Under normal conditions, the machine's present status is saved each time a change is made. The "power-down" save (auto-save) may be disabled using this code. Note that whenever the machine is turned on, the auto-save function is set.

NOTE 13 - This is a request to identify the switcher/s in the system. If the OUTPUT is set as 0, and the INPUT is set as 1, 2, 5 or 7, the machine will send its name. The reply is the decimal value of the INPUT and OUTPUT. For example, for a 2216, the reply to the request to send the audio machine name would be (HEX codes):
7D 96 90 81 (i.e. 128dec+ 22dec for 2nd byte, and 128dec+ 16dec for 3rd byte).

If the request for identification is sent with the INPUT set as 3 or 4, the appropriate machine will send its software version number. Again, the reply would be the decimal value of the INPUT and OUTPUT - the INPUT representing the number in front of the decimal point, and the OUTPUT representing the number after it. For example, for version 3.5, the reply to the request to send the version number would be (HEX codes):
7D 83 85 81 (i.e. 128dec+ 3dec for 2nd byte, 128dec+ 5dec for 3rd byte).

If the OUTPUT is set as 1, then the ASCII coding of the lettering following the machine's name is sent. For example, for the VS-7588YC, the reply to the request to send the first suffix would be (HEX codes):
7D D9 C3 81 (i.e. 128dec+ ASCII for "Y"; 128dec+ ASCII for "C").

NOTE 14 - The number of inputs and outputs refers to the specific machine which is being addressed, not to the system. For example, if six 16X16 matrices are configured to make a 48X32 system (48 inputs, 32 outputs), the reply to the HEX code
3E 82 81 82 (ie. request the number of outputs)
would be HEX codes
7E 82 90 82
ie. 16 outputs

NOTE 15 – When the OVR bit (4th byte) is set, then the "video" commands have universal meaning. For example, instruction 1 (SWITCH VIDEO) will cause all units (including audio, data, etc.) to switch. Similarly, if a machine is in "FOLLOW" mode, it will perform any "video" instruction.
NOTE 16 - The reply to the "REQUEST WHETHER PANEL IS LOCKED" is as in NOTE 4 above, except that here the OUTPUT is assigned with the value 0 if the panel is unlocked, or 1 if it is locked.

NOTE 25 – For units which detect the validity of the video inputs, Instruction 16 will be sent whenever the unit detects a change in the state of an input (in real-time).
For example, if input 3 is detected as invalid, the unit will send the HEX codes
10 83 84 81
If input 7 is detected as valid, then the unit will send HEX codes
10 87 85 81.

LIMITED WARRANTY

Kramer Electronics (hereafter *Kramer*) warrants this product free from defects in material and workmanship under the following terms.

HOW LONG IS THE WARRANTY

Labor and parts are warranted for seven years from the date of the first customer purchase.

WHO IS PROTECTED?

Only the first purchase customer may enforce this warranty.

WHAT IS COVERED AND WHAT IS NOT COVERED

Except as below, this warranty covers all defects in material or workmanship in this product. The following are not covered by the warranty:

1. Any product which is not distributed by Kramer, or which is not purchased from an authorized Kramer dealer. If you are uncertain as to whether a dealer is authorized, please contact Kramer at one of the agents listed in the Web site www.kramerelectronics.com.
2. Any product, on which the serial number has been defaced, modified or removed, or on which the WARRANTY VOID IF TAMPERED sticker has been torn, reattached, removed or otherwise interfered with.
3. Damage, deterioration or malfunction resulting from:
   i) Accident, misuse, abuse, neglect, fire, water, lightning or other acts of nature
   ii) Product modification, or failure to follow instructions supplied with the product
   iii) Repair or attempted repair by anyone not authorized by Kramer
   iv) Any shipment of the product (claims must be presented to the carrier)
   v) Removal or installation of the product
   vi) Any other cause, which does not relate to a product defect
   vii) Cartons, equipment enclosures, cables or accessories used in conjunction with the product

WHAT WE WILL PAY FOR AND WHAT WE WILL NOT PAY FOR

We will pay labor and material expenses for covered items. We will not pay for the following:

1. Removal or installations charges.
2. Costs of initial technical adjustments (set-up), including adjustment of user controls or programming. These costs are the responsibility of the Kramer dealer from whom the product was purchased.
3. Shipping charges.

HOW YOU CAN GET WARRANTY SERVICE

1. To obtain service on you product, you must take or ship it prepaid to any authorized Kramer service center.
2. Whenever warranty service is required, the original dated invoice (or a copy) must be presented as proof of warranty coverage, and should be included in any shipment of the product. Please also include in any mailing a contact name, company, address, and a description of the problem(s).
3. For the name of the nearest Kramer authorized service center, consult your authorized dealer.

LIMITATION OF IMPLIED WARRANTIES

All implied warranties, including warranties of merchantability and fitness for a particular purpose, are limited in duration to the length of this warranty.

EXCLUSION OF DAMAGES

The liability of Kramer for any effective products is limited to the repair or replacement of the product at our option. Kramer shall not be liable for:

1. Damage to other property caused by defects in this product, damages based upon inconvenience, loss of use of the product, loss of time, commercial loss; or:
2. Any other damages, whether incidental, consequential or otherwise. Some countries may not allow limitations on how long an implied warranty lasts and/or do not allow the exclusion or limitation of incidental or consequential damages, so the above limitations and exclusions may not apply to you.

This warranty gives you specific legal rights, and you may also have other rights, which vary from place to place.

NOTE: All products returned to Kramer for service must have prior approval. This may be obtained from your dealer.

This equipment has been tested to determine compliance with the requirements of:

EN-50081:	"Electromagnetic compatibility (EMC); generic emission standard. Part 1: Residential, commercial and light industry"
EN-50082:	"Electromagnetic compatibility (EMC) generic immunity standard. Part 1: Residential, commercial and light industry environment".
CFR-47:	FCC* Rules and Regulations: Part 15: “Radio frequency devices Subpart B Unintentional radiators”

CAUTION!

- Servicing the machines can only be done by an authorized Kramer technician. Any user who makes changes or modifications to the unit without the expressed approval of the manufacturer will void user authority to operate the equipment.
- Use the supplied DC power supply to feed power to the machine.
- Please use recommended interconnection cables to connect the machine to other components.

  * FCC and CE approved using STP cable (for twisted pair products)

For the latest information on our products and a list of Kramer distributors, visit our Web site: www.kramerelectronics.com where updates to this user manual may be found.
We welcome your questions, comments and feedback.

Safety Warning:
Disconnect the unit from the power supply before opening/servicing.

Kramer Electronics, Ltd.
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E-mail: info@kramerel.com
P/N: 2900-000517 REV 1